New York State Experience with Hamilton College Clinton, N.Y. and Plans for Future University and College Support

Hamilton Report Title

Awareness and Enforcement of the Residential Energy Code: A study of code enforcement officials in New York State

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Background on Residential Energy Codes

- Residential energy codes can be effective tools to reduce energy consumption.

- For energy codes to be effective, it is necessary for code enforcement officials to ensure compliance and enforce the regulations through plan reviews and on-site inspections.

Origins and Purpose of Study

- With the move to the International Codes, the Department of State wanted to know the extent code enforcement officials (CEOs) were aware of the current code (which until recently received much less support – “no Energy Office”) and if they were checking compliance.
- To assess CEOs’ awareness and compliance procedures of the residential energy code.
- To assess policy recommendations to make compliance of the code more effective.

Data

- This study began with a base of 3,400 individuals who attended CEO training in 1996. About 90% of these people are CEOs. From this list, a sample was drawn.
- 570 surveys were sent to 9 counties: Erie, Jefferson, Madison, Niagara, Oneida, Orange, Rockland, St. Lawrence, and Suffolk.
- Total response rate was 33%.

Data (cont.)

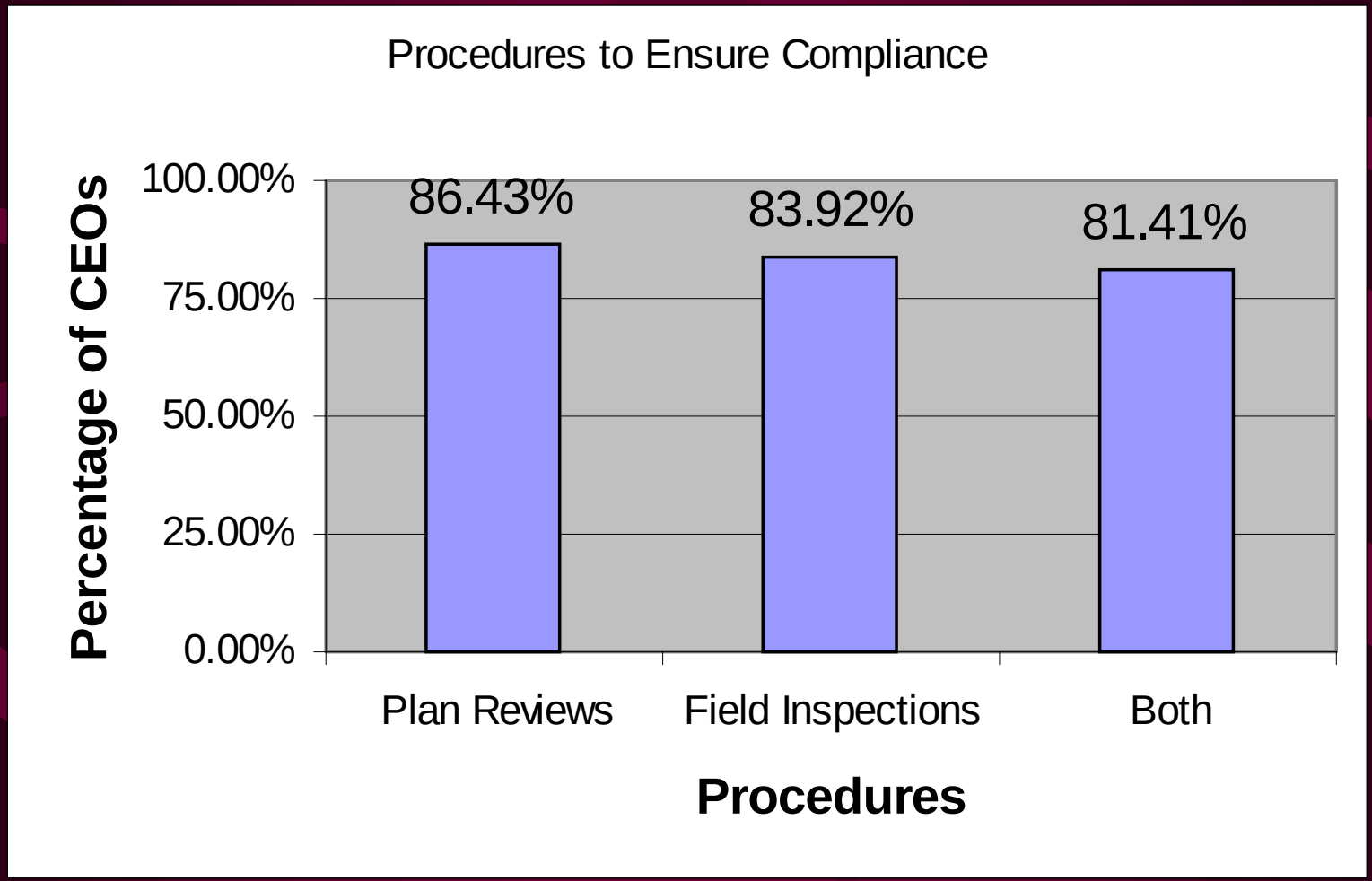
Type of Jurisdiction	Number of Surveys	Percentage of Total Number of Surveys
Rural	50	28.25%
Suburban	**111**	**62.71%**
Urban	16	9.04%

In addition interviews were conducted after the collection of surveys. There were a total of 12 telephone interviews performed in this study.

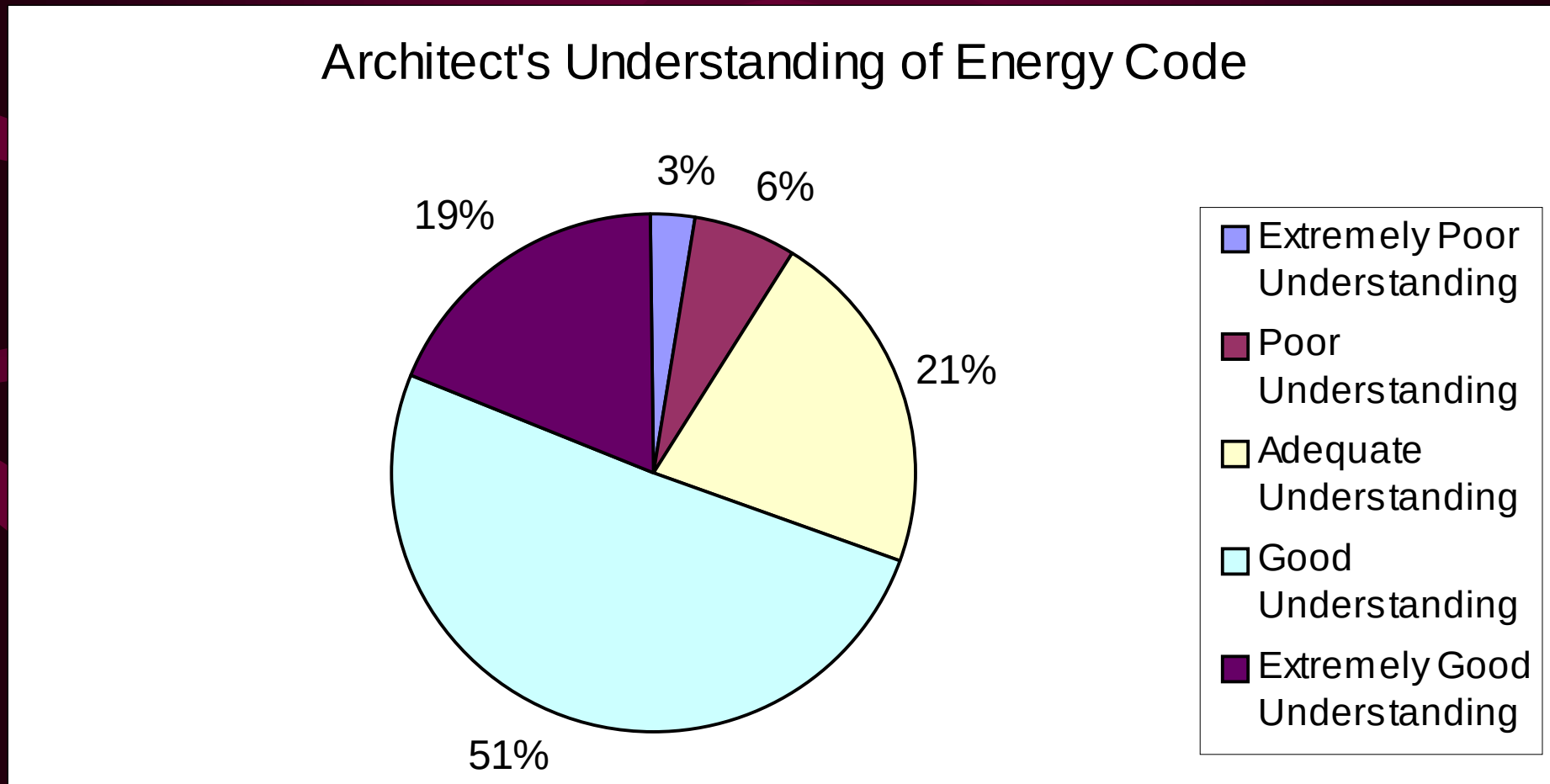
Code Awareness and Understanding

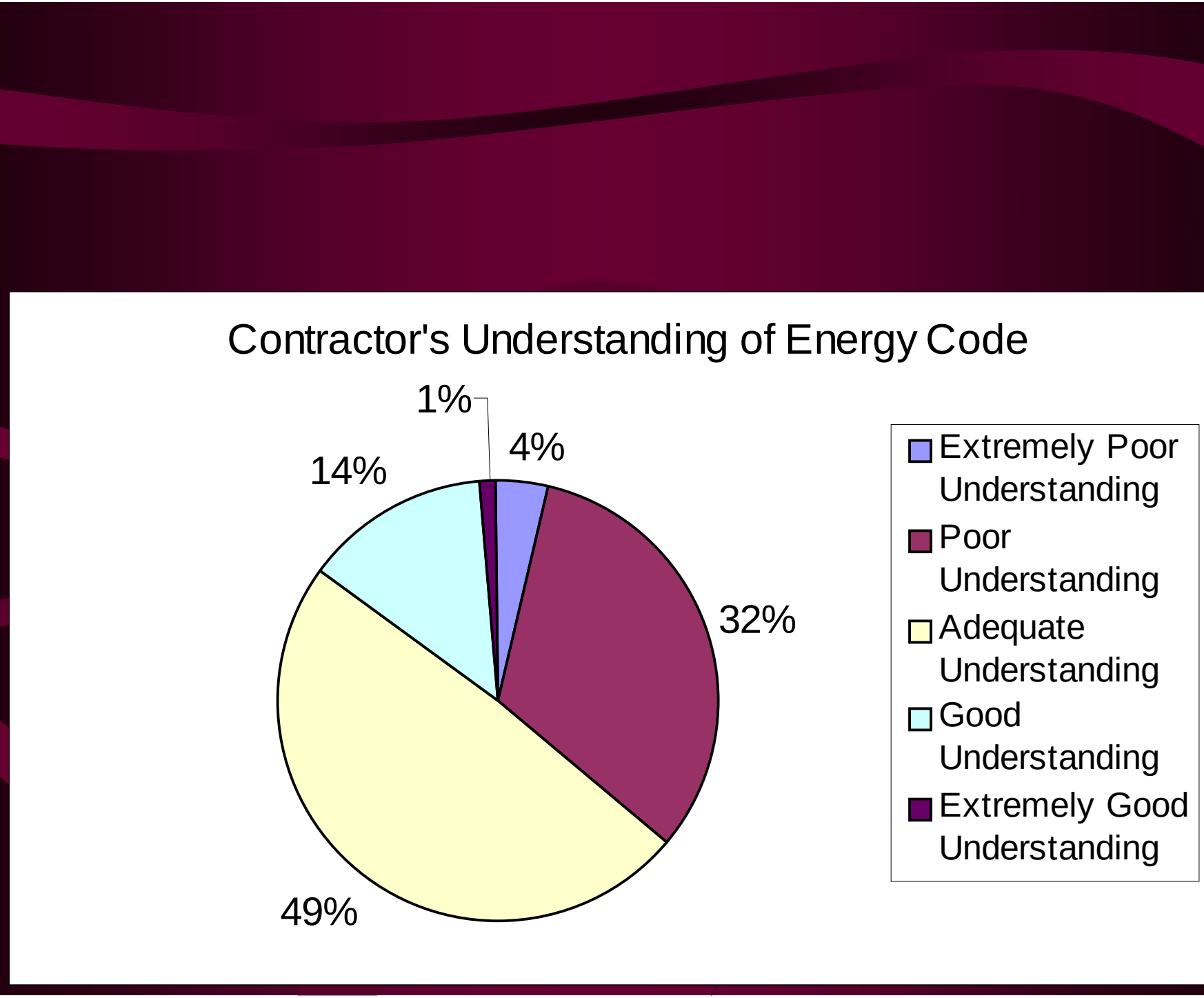
Ranking	Group	Average score	Standard Deviation	Percentage of group's poor or extremely poor understanding
1--Best understanding	Architects	2.75	0.938	10%
2	Engineers	2.661	1.010	13%
3	Code Enforcement Officials	2.634	0.9779	11%
4	Contractors	1.7288	0.7723	37%
5	Developers	1.50292	0.9724	50%
6—Worst understanding	Building Owners	0.96022	.72789	81%

Plan Reviews and Inspections



Code Awareness and Understanding (cont.)




Contractor's Understanding of Energy Code
1%
4%
14%
32%
49%
Extremely Poor Understanding
Poor Understanding
Adequate Understanding
Good Understanding
Extremely Good Understanding

Code Awareness and Understanding (cont.)

- Conclusions:
  - From CEOs perception, architects and engineers have the best understanding of the energy code. This perception may be due to the type of interactions that CEOs have with these groups in the compliance process.
  - Awareness of the change to a new code next year increases as the code enforcement area is more urban.

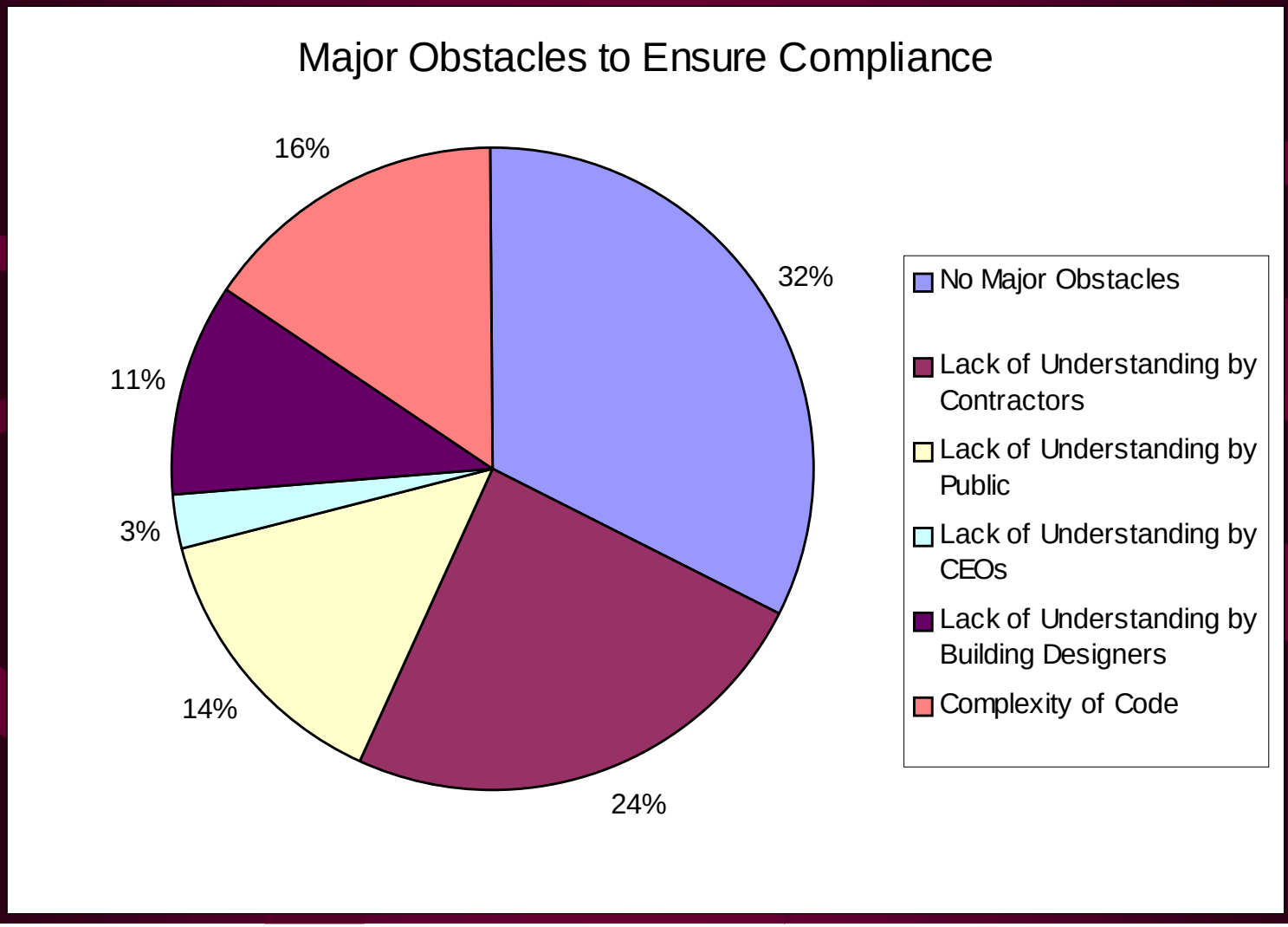
Number of Actual Site Inspections

Site Inspections	Percentage of CEOs in rural jurisdictions (N=50)	Percentage of CEOs in suburban jurisdictions (N=110)	Percentage of CEOs in urban jurisdictions (N=16)	Percentage of total CEOs (N=182)
0	2.00%	8.18%	25.00%	9.89%
1	20.00%	33.64%	12.50%	27.47%
2	**50.00%**	**30.91%**	18.75%	**34.62%**
3 or more	28.00%	26.36%	**43.75%**	27.47%

Code Enforcement (cont.)

- Conclusions:
  - About one-fifth of CEOs are not checking for compliance to the energy code on plan reviews and field inspections.
  - The majority of CEOs in all types of jurisdictions perform at least 2 or more site inspections to check for compliance of the energy code.
  - Majority of CEOs from all office sizes perform at least one site inspection for the energy code. However, for CEOs in an medium-size office (11 to 20 full-time employees) one-third of the CEOs state that they do not do any site inspections. (CEO “specialties focus”)

CEO “Obstacles to Compliance”



Obstacles to Compliance (cont.)

Most Difficult Item	CEOs in rural jurisdiction	CEOs in suburban jurisdiction	CEOs in urban jurisdiction	Total CEOs
Air Leakage	**60.00%**	**28.57%**	**75.00%**	**40.45%**
Envelope System	3.33%	10.00%	0.00%	8.11%
Envelope U-Value/R-factor	6.67%	11.43%	0.00%	9.01%
Glazing	6.67%	5.71%	0.00%	5.41%
HVAC systems and components	**10.00%**	**21.43%**	0.00%	**18.92%**
Lighting/electrical and controls	**10.00%**	**21.43%**	**25.00%**	**16.225**
Vapor Retarders	3.33%	1.43%	0.00%	1.80%

Obstacles to Compliance (cont.)

Item	% of CEOs ranks item as 1	% of CEOs ranks item as 2	% of CEOs ranks item as 3	% of CEOs ranks item as 4	% of CEOs ranks item as 5	% of CEOs ranks item as 6
Air Leakage	20.56%	23.36%	**24.43%**	**16.82%**	8.41%	8.41%
Envelope U-value/ R-factor	71.03%	20.56%	5.61%	1.87%	0.93%	0.00%
Glazing	0.93%	25.23%	30.84%	26.17%	5.61%	11.21%
HVAC systems and components	0.93%	17.76%	15.89%	**26.17%**	**35.51%**	3.74%
Lighting/Electrical controls	0.93%	2.80%	3.74%	14.02%	**18.69%**	**59.81%**
Vapor Retarders	5.66%	10.38%	21.70%	15.09%	32.08%	15.09%

Future Support

- When CEOs were asked what portions of the code they needed more training and support for:
  - 60% of CEOs wanted to learn more about building envelopes
  - 37% of CEOs wanted to learn details regarding mechanical systems
  - 3% of CEOs wanted to learn more about lighting

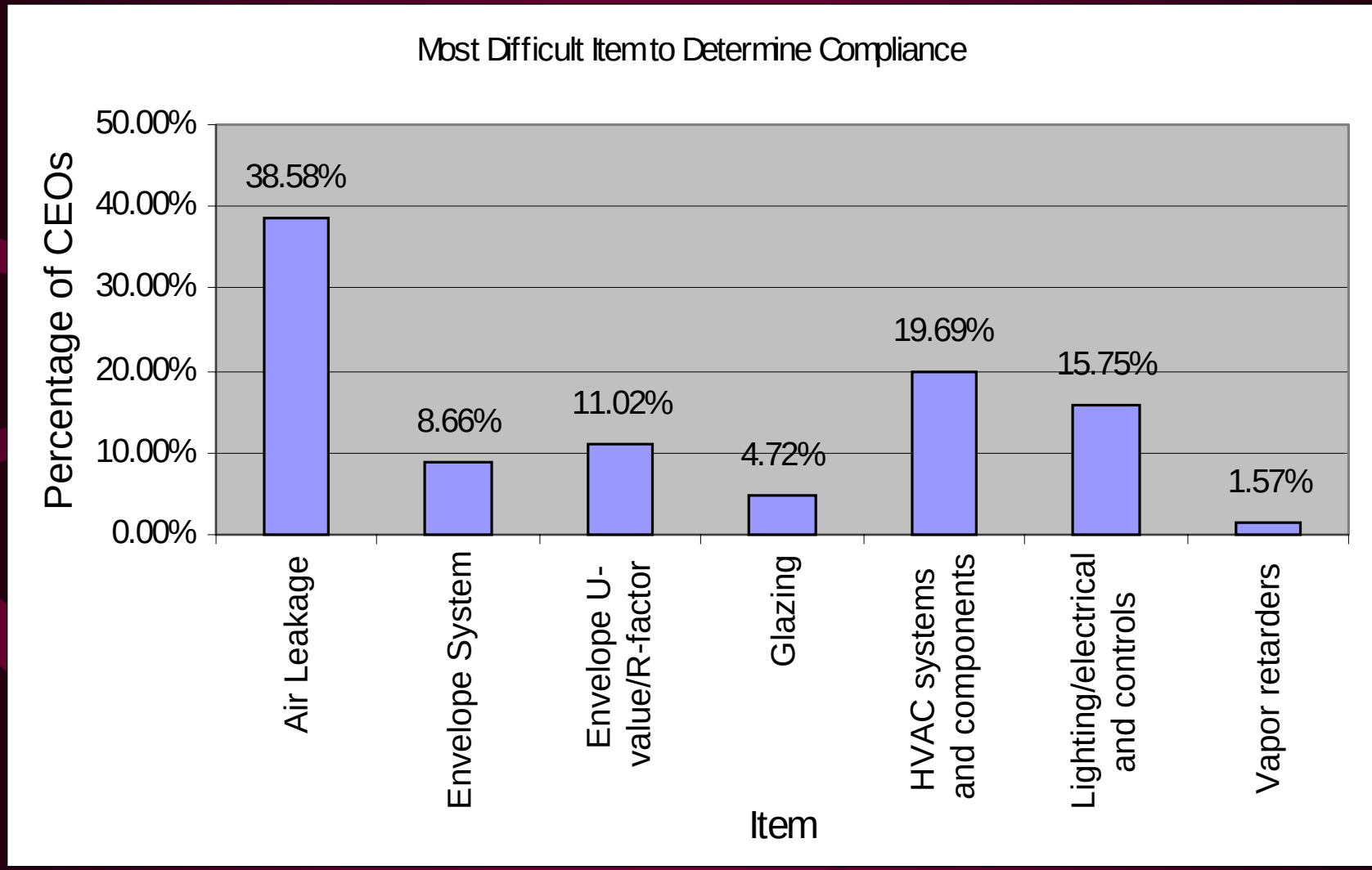
Obstacles to Compliance (cont.)

- Conclusions:
  - CEOs believe that the major obstacles to compliance of the energy code are lack of understanding by contractors of the requirements and complexity of code.

Obstacles to Compliance (cont.)

- Conclusions (cont.):
  - CEOs might be overlooking certain parts of the energy code when checking for compliance.
    - CEOs stated that the most difficult items to check for compliance were air leakage, HVAC system and components, and lighting/electrical controls.
    - Interestingly, CEOs believed that these were the least important items in regards to compliance.
    - Only about 3% of the CEOs wanted to learn more about lighting.
    - These findings are ambiguous because it either tells us that CEOs find these items difficult to check for compliance; therefore, they consider them the least important or that CEOs find these items the least important; therefore, they do not take the initiative to understand these items and finds them the most difficult in compliance. Our job is to assist in finding out and aiding their focus on all important items.

Difficulty in Determining Compliance



Sources of Information (cont.)

- Places where CEOs are not looking for information
  - 97.5% of CEOs have contacted the Codes Division Field Office 0 to 5 times in the past year for technical assistance
  - 97.5% of CEOs have contacted the Codes Division Main Albany Office 0 to 5 times in the past year for technical assistance
  - About 18.6% of CEOs would contact the regional office
  - About 7.6% of CEOs would contact the Albany main office

Source of Information (cont.)

- Places where CEOs look for information on the energy code
  - 89% of CEOs stated that they would read the code for information.
    - However, 91% of these CEOS who would read the code have a copy of the 1991 NYS energy code.
  - Overall, 84% of CEOs have a copy of the code.
    - Of these CEOs, 94% have the current version.

Sources of Information (cont.)

- To gain more knowledge about the energy code:
  - 72% of CEOs want workshops (on-site, hands-on training)
  - 40% of CEOs want self-study training manual
  - 84% of CEOs stated that they would definitely or somewhat likely use the Internet website to the New York State Energy code
    - Of these CEOs, 69% of them already have Internet access

Sources of Information (cont.)

- Conclusions:
  - Only a small percentage see the code offices as resources for technical assistance.
  - Most CEOs want to be independent and obtain information through code books or manuals.
    - Most CEOs have the current version of the code book.
    - The Internet can be another useful tool for CEOs to obtain information in this way.
  - CEOs want more on-site, hands-on training when learning about the energy code.

Policy Recommendations

- Uniform procedures on plan reviews and on-site inspections
  - From surveys and interviews, CEOs do not cover all aspects of energy code such as lighting, air leakage, or mechanical systems.
  - To ensure that CEOs cover all parts of the energy code during inspections, a checklist of items to check during on-site inspections.

Policy Recommendations

- Simplify Complexity of Energy Code
  - From interviews, CEOs state that the flexibility of the current code results in confusion for CEOs or lack of attention to details when looking at compliance. The Department of State should re-evaluate the code with the perspective of the technical knowledge that current CEOs have.
  - With the move toward an International Code, the Department of State has to re-evaluate whether this is a step to simpler or more complex code. The lack of understanding of the current code by CEOs draws some concern about how effective this new code will be, especially since it will be effective in early 2002.

Policy Recommendations

- Continual Evaluation of CEOs Awareness and Enforcement
  - It is necessary to re-evaluate awareness and enforcement, especially after the International Codes have been in place for some time.
    - This study is a good start in how to increase CEOs' awareness of the energy code for this new move.
    - Assessment should be done annually to ensure CEOs are using the new system and are properly checking for compliance.
  - A detailed database registry of CEOs in New York will be helpful for communication from the Department to this group and for a more effective study in the future.

Ideas NY Plans to Develop in 2002 with Colleges and Universities

- Web Site Development
- Survey work to Assess Code User Needs
- Survey work to Assess Code's Future Impact
- Training development
- Newsletter Creation
- Technical Field Guide Development
- Solicit Industry for Outreach (training and ad budgets)
- General Energy Science "RFP" to Work with Class Projects

The End
(or just the beginning)